Professional resume

Noémi Kis

Date of birth: 1996.02.15.
Place of birth: Eger
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Studies:

2020 -	Semmelweis University, János Szentágothai Doctoral School of Neuroscience
2018 - 2020	Pázmány Péter Catholic University Faculty of Information Technology and Bionics, MSc in Info-Bionics Engineering (in English)
2014 - 2018	Pázmány Péter Catholic University Faculty of Information Technology and Bionics, BSc in Molecular Bionics Engineering
2010 - 2014	Berze Nagy János High School

Knowledge of languages:

2020	English (advanced)

Knowledges:

2020	Experimental Animals - Animal Experiments Course "B" Level

Research activity:

Period	2017 -
Institute	Institute of Experimental Medicine, Laboratory of Neuronal Signaling
Supervisor	Dr. Judit Makara
Research field	Investigation of dendritic integration in hippocampal neurons

Scientific awards:

2022	Stephen W. Kuffler PhD Scholarship

Publications:

- Raus Balind, S., Magó, Á., Ahmadi, M., Kis, N., Varga-Németh, Z., Lőrincz, A. and Makara, J. Diverse synaptic and dendritic mechanisms of complex spike burst generation in hippocampal CA3 pyramidal cells. *Nature Communications. 2019, 10:1859*
- Ádám Magó*, Noémi Kis*, Balázs Lükő, Judit K. Makara, Distinct dendritic Ca2+ spike forms produce opposing input-output transformations in rat CA3 pyramidal cells, *eLife, 2021, 10:e7449*
  *shared first authors

Presentations

- Noémi Kis, Ádám Magó, Snezana Raus Balind, Mahboobeh Ahmadi, Balázs Lükő, Judit Makara, Unique properties of dendritic Ca^{2+} spikes in hippocampal CA3 pyramidal neurons, *XXIII. SCIENTIFIC SYMPOSIUM, 2019*
- *PhD Scientific days, 2021*

Posters

- Snezana Raus Balind, Noémi Kis, Zsófia Varga-Németh, Judit Makara, Diversity of dendritic spikes underlying complex spike bursting in CA3 pyramidal cells, *Crete, EMBO, 2018*
- Snezana Raus Balind, Ádám Magó, Mahboobeh Ahmadi, Noémi Kis, Zsófia Varga-Németh, and Judit K. Makara, Diversity of dendritic spikes underlying complex spike bursting in CA3 pyramidal cells, US, *Gordon research conference, 2019*
- Noémi Kis, Ádám Magó, Balázs Lükő, Judit Makara, Unique properties of dendritic Ca^{2+} spikes in CA3 pyramidal neurons, *Young Scientist Network Mini-Conference, 2021*
- Noémi Kis, Ádám Magó, Balázs Lükő, Judit Makara, Unique properties of dendritic Ca^{2+} spikes in CA3 pyramidal neurons, *Hungarian Neuroscience Doctoral Conference for Undergraduate Students, Graduate Students and Junior Post-Docs (HuNDoC), 2022*
- Noémi Kis, Ádám Magó, Balázs Lükő, Judit Makara, Unique properties of dendritic Ca^{2+} spikes in CA3 pyramidal neurons, *International Neuroscience Meeting (IBRO), 2022*

Scientific interest

I started my scientific work at the Institute of Experimental Medicine, where as a student I joined the work in the group of Dr. Judit Makara, the Laboratory of Neuronal Signaling. During my work, I became acquainted with the technique of patch-clamp recording and two-photon microscopic imaging, and then using these methods I investigated the firing properties of different pyramidal cells in hippocampal brain slices, primarily the “complex spike burst” (CSB) firing, which may play a role in spatial coding. In addition, I prepared three-dimensional cell reconstructions to investigate the question of how the firing behavior of pyramidal cells depends on the passive electrical properties of the dendritic tree of the neuron, i.e., its morphological characteristics.

The main goal of my research is to better understand the dendritic integration properties of CA3 and CA1 pyramidal cells and the role of these processes in information coding.

In our recent publication (Raus Balind et al., 2019, Nature Communications), we showed that CSBs in CA3 pyramidal cells are induced by dendritic Ca^{2+} spikes. However, we observed that CSB firing ability is very heterogeneous among CA3 pyramidal cells: our results show morphological, electrophysiological, and synaptic integration heterogeneity, suggesting that cells with different properties have different functions and that the variability of dendritic Ca2+ spikes may be the due to CSB heterogeneity. I contributed to this research with both morphological analysis and electrophysiological experiments.